IBIS-PH Query System Workbook

Office of Public Health Assessment

Utah Department of Health

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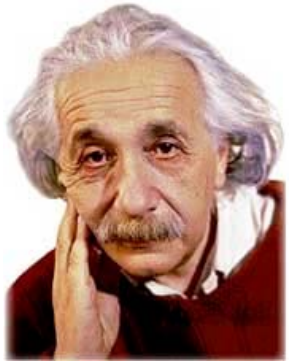
You shouldn't have to be ...



... to get the data you need.

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A) Introduction

An understanding of the health status of a population is necessary to plan, implement, and evaluate public health programs that control and prevent adverse health events. The Utah Indicator-Based Information System for Public Health (IBIS-PH) web site is designed to provide quick and easy access to information to inform public health policy development and decision-making. It provides important information on the population characteristics, health status, health determinants, and health care systems in Utah.

On IBIS-PH, numerous data sets allow public health practitioners to stay informed on population health status and health systems. The IBIS query system allows visitors to access many of these data sets directly. Effective presentation, in the context of a readily-understandable public health message, facilitates informed, evidence-based policy development. So IBIS-PH presents public health measures in an understandable context on the Indicator Profile pages.

IBIS-PH is a third generation information system built upon the strengths of previous systems developed at the Utah Department of Health. The Office of Public Health Assessment (OPHA) has taken the lead in the development of this iteration of the system, under the direction of Lois Haggard Ph.D. A major focus of OPHA is to take a leadership role in analyzing and disseminating a broad range of health and injury data about Utah, and ensuring that those data are analyzed appropriately, made accessible to a wide audience, and presented effectively.

Development of the IBIS-PH system was supported in part by the Health Resources and Services Administration (HRSA, MCHB award # 1 U93 MC 00172-01, CFDA # 93.110), and the Centers for Disease Control and Prevention (CDC Assessment Initiative award # U82/CCU822377-02, program announcement #02104).

B) Counts

A count is simply the number of health events that occurred. When communicating with health planning groups or legislators, sometimes the total number of health events conveys an important message. The total number of health events such as death, birth, hospitalization can also convey the magnitude of the prevention effort required, or the health care that may need to be provided.

Exercise:

Use the IBIS-Q Birth query system to find the number (count) of births to mothers who were age 35 or over in Utah for 2002. Use the drill-down feature to find how many of those were in your local health district.

Table 1: Count of All Live Births to Women Age 35 and Over by Local Health District, Utah, 2002.

Local Health District of Residence	
ALL	4,293
Bear River	204
Central Utah	97
Davis County	458
Salt Lake County	1,792
Southeastern Utah	75
Southwest Utah	251
Summit County	90
Tooele County	58
Tri-County	50
Utah County	908
Wasatch County	50
Weber/Morgan	260

Data source: Utah Birth Certificate Database, Office of Vital Records and Statistics, Utah Department of Health. Most rates are computed using number of persons in the population. IBIS population estimates are from 2002 Baseline Projections, Governor's Office of Planning and Budget, UPED Model System.

C) Crude Rates

Usually, the count alone has little meaning unless the size of the population from which it is derived is known. A rate is a fraction, in which the numerator is the number of people in whom an event occurred during a certain period of time, and the denominator is the total number of people in the population at risk for the same period of time. Rates are typically multiplied by some factor of ten so that the result is a whole number.

Exercise:

Use the IBIS-Q Hospital Discharge query system to find the number of hospital discharges for cerebrovascular disease per 10,000 population in your county for 2001. (Hint: Use the "NCHS 50 leading causes" predefined list to select cerebrovascular disease.)

Table 2: Number of Cardiovascular Disease Discharges Per 10,000 Population by County, Utah, 2001.

Residential County	Rate per 10,000 pop.		
	Total Number of Discharges	Total Number of Population	Hospitalization Rate
San Juan	X	14,063	X
Beaver	13	6,198	20.97
Garfield	8	4,630	17.28
Iron	51	34,920	14.60
Kane	8	6,037	13.25
Washington	215	95,584	22.49

Table 2: (continued)

Residential County	Rate per 10,000 pop.		
	Total Number of Discharges	Total Number of Population	Hospitalization Rate
Total	2,944	2,295,964	12.82
Box Elder	73	43,245	16.88
Cache	98	93,372	10.50
Rich	X	1,983	X
Morgan	8	7,297	10.96
Weber	324	200,567	16.15
Davis	285	244,844	11.64
Salt Lake	1,222	918,278	13.31
Summit	27	31,278	8.63
Tooele	36	44,430	8.10
Utah	341	385,690	8.84
Wasatch	11	15,947	6.90
Duchesne	27	14,646	18.44
Uintah	42	26,050	16.12
Juab	10	8,570	11.67
Millard	15	12,326	12.17
Piute	X	1,404	X
Sanpete	22	23,218	9.48
Sevier	26	19,180	13.56
Wayne	5	2,509	19.93
Carbon	35	19,858	17.63
Emery	17	10,473	16.23
Grand	13	8,423	15.43

Data source: Utah Inpatient Hospital Discharge Data, Office of Health Care Statistics, Utah Department of Health. Most rates are computed using number of persons in the population. IBIS population estimates are from 2002 Baseline Projections, Governor's Office of Planning and Budget, UPED Model System.

D) Age and Sex Specific Rates

An age-specific rate is a fraction in which both the numerator (number of events) and denominator (number in population at risk) are limited to a specific age group. calculated by dividing the total number of health events for the specific age-group of interest by the total population in that age group. In Table 3, the age-specific rates for suicide are shown. The example demonstrates that the greatest number of suicides occur in the young, whereas the highest rate occurs among elderly men. The example in Table 3 also shows how useful age- and sex-specific rates can be. Not only are the suicide death rates much higher among men, the rate of suicide increases among men with age, but not among women.

Exercise:

Find the rate for Suicides in Males age 45-64 in 2000. (Hint: Use NCHS 50 leading causes list – injury, intentional self-harm.)

Table 3: Number of Suicides Per 100,000 Persons by Age and Sex, Utah, 1990.

Age-Group	Suicide Deaths Women	Population Women	Rate**	Suicide Deaths Men	Population Men	Rate**
<16	2	263,161	0.8	4	277,399	1.4
16-44	33	396,726	8.3	139	397,021	36.0
46-64	4	126,633	32	49	120,132	40.8
66+	2	86,706	2.3	32	64,319	49.8

*Numbers may differ slightly from other published reports because of rounding

Table 4: Number of Suicide Per 100,000 Population in Males Age 45-64 Years, Utah, 2000.

Age Group	**Death Rates (per 100,000 pop.)**		
	Number of Deaths	**Number of Population**	**Death Rate (per 100,000 pop.)**
45-64	47	189,564	24.79

Date source: Utah Death Certificate Database, Office of Vital Records and Statistics, Utah Department of Health. Most rates are computed using number of persons in the population. IBIS population estimates are from 2002 Baseline Projections, Governor's Office of Planning and Budget, UPED Model System

E) Age-Adjusted Rates

An adjusted rate is an overall summary measure that helps control for demographic differences between populations. The most commonly used adjusted rate is the age-adjusted rate, which controls for age differences between two or more populations. When comparing across geographic areas, some method of age adjusting is typically used to control for area-to-area differences in health events that can be explained by differing age distributions of the area populations. For example, an area that has an older population will have higher crude (not age-adjusted) rates for cancer, even though its exposure levels and cancer rates for specific age groups are the same as those of other areas. One might incorrectly attribute the high cancer rates to some characteristic of the area other than age. Age-adjusted rates control for age effects, allowing better comparability of rates across areas. Age-adjustment may also be used to control for age effects when comparing across several years of data, as the age distribution of the population changes over time.

The age-adjusted rate is hypothetical, and is useful only for comparing populations, either over time, by geographic area, by sex or by racial/ethnic subgroups. Although age-adjustment may be used with large age sub-groups of the population, such as adults (e.g., age 18+), it is not meaningful to age-adjust "age-specific" rates (e.g., age 18-24).

Exercise:

Find the Age-adjusted Rate for Leukemia (4 categories in the list of 41 standard sites) for 1997-2001 in your Local Health District.

For more information on Counts, Crude Rates, Age and Sex Specific Rates and Age-Adjusted Rates please see http://hlunix.hl.state.ut.us/ibisq/compute_rate2.htm.

Table 5: Age-adjusted Leukemia Incidence Per 100,000 Population by Local Health District, Utah, 1997-2001. (Standard population is 2000.)

Local Health District	Age-adjusted Cancer Incidence Rates (per 100,000 pop.)		
	Number of cancer incidents	Number of population	Age-adjusted cancer incidence rate (per 100,000 pop.)
Bear River	48	669,892	9.69
Central Utah	35	327,078	11.16
Davis County	110	1,174,205	13.22
Salt Lake County	351	4,435,302	10.04
Southeastern Utah	31	270,426	12.54
Southwest Utah	70	688,382	10.83
Summit County	11	144,016	10.97
Tooele County	13	193,194	8.95
Uintah Basin	29	201,954	18.45
Utah County	121	1,795,518	10.56
Wasatch County	12	73,378	19.95
Weber/Morgan	101	1,003,201	12.01

Date source: Utah Cancer Registry Database. Most rates are computed using number of persons in the population. IBIS population estimates are from Utah Governor's Office of Planning and Budget population estimates.

F) Small Numbers

A rate calculation may be of limited value when derived from a small population. Rates based on small numbers are statistically more likely to be affected by chance variation and have large variability across time periods. One method of dealing with small numbers is to combine data over time, space, or people. Aggregate space by combining counties into local health departments, aggregate people by combining gender and age groups, or aggregate time by combining the years selected.

Confidentiality criteria are applied to protect the confidentiality of members of the population from which the data derive. One must assume that all information is sensitive information. In the data use agreement, which everyone must accept before using the query system, people agree not to use the data to try and identify individuals and to notify the director of the CHD if identity is discovered.

Exercise:

Find the rate of Infant Mortality for your county for 2000-2002. Notice in Table 6 that many of the cells are suppressed. This is because the number of events is considered too small to report without risking identification of an individual.

Only a selection of counties is displayed in the table due to the large number of counties in Utah.

Table 6: Infant Mortality Per 1,000 Live Births by County, Utah, 2000-2002.

Residential County	**Detail Information**			
	# of Infant Deaths (less than 365 days)	**Total # of Live Births**	**Infant Mortality Rate per 1,000 Live Births**	**95% Confidence Interval**
ALL	746	144,386	5.17	4.80 - 5.54
Beaver	X	345	X	X
Box Elder	9	2,374	3.79	1.32 - 6.26
Cache	27	6,660	4.05	2.53 - 5.58
Carbon	7	912	7.68	2.01 - 13.34
Davis	57	14,975	3.81	2.82 - 4.79
Duchesne	X	875	X	X
Emery	X	507	X	X
Garfield	X	195	X	X
Grand	X	349	X	X
Iron	12	2,299	5.22	2.27 - 8.17
Juab	X	521	X	X
Millard	6	565	10.62	2.17 - 19.07
Morgan	X	300	X	X
Piute	X	54	X	X
Salt Lake	307	54,996	5.58	4.96 - 6.20

Date source: Utah Death Certificate Database and Utah Birth Certificate Database, Office of Vital Records and Statistics, Utah Department of Health. Most rates are computed using number of persons in the population. IBIS population estimates are from Utah Governor's Office of Planning and Budget population estimates.

G) Confidence Intervals

Observed health statistics, that is, those counts, rates or percentages that are computed or estimated from health surveys, vital statistics registries, or other health surveillance systems are not always an accurate reflection of the true underlying risk in the population. Observed rates can vary from sample to sample or year to year, even when the true underlying risk remains the same. Confidence intervals are used to provide an estimate of the potential discrepancy between the true and observed rates. The confidence interval is a range of values within which the "true" value of the rate is expected to occur. For a 95% confidence interval it is the range of values within which the true value will occur 95% of the time. In general, confidence intervals based on a large number of events are narrower and imply more precision than the wider intervals associated with rates based on a small number of events.

Exercise:

Find the crude rates and confidence intervals for Health Insurance Coverage in 2001 using the Health Status Survey.

For detailed information on Confidence Intervals see http://hlunix.hl.state.ut.us/ibisq/ConfInts.pdf.

Table 7: Health Insurance Rates, Utah, 2001.

Year	Health Insurance	Number in Sample	Percentage	95% CI Lower	95% CI Upper
2001	Insured	20,884	91.3%	90.5%	92.1%
2001	Uninsured	2,095	8.7%	7.9%	9.5%

Data source: Utah Health Status Survey, Office of Public Health Assessment, Utah Department of Health

H) Time

By viewing several years of data you can see how rates change over time and determine trends. Due to the changing age distribution of the population it is useful to use age-adjusted rates to compare rates over several years.

Exercise:

See how the Diabetes rate changes over time (1989-2002) using the BRFSS Survey data.

Table 8: Diabetes Age-adjusted Rate, Utah, 1989-2002.

Year	Diabetes	Number in Sample	Percentage	95% CI Lower	95% CI Upper
Total	Have diabetes	1,268	4.6%	4.3%	5.0%
Total	No or pregnancy only	27,564	95.4%	95.0%	95.7%
1993	Have diabetes	64	3.9%	2.8%	5.0%
1993	No or pregnancy only	1,730	96.1%	95.0%	97.2%
1994	Have diabetes	73	4.5%	3.4%	5.6%
1994	No or pregnancy only	1,737	95.5%	94.4%	96.6%
1995	Have diabetes	107	4.3%	3.3%	5.3%
1995	No or pregnancy only	2,780	95.7%	94.7%	96.7%
1996	Have diabetes	113	3.7%	2.9%	4.6%
1996	No or pregnancy only	2,766	96.3%	95.4%	97.1%
1997	Have diabetes	109	4.6%	3.5%	5.6%
1997	No or pregnancy only	2,747	95.4%	94.4%	96.5%
1998	Have diabetes	127	4.7%	3.8%	5.7%
1998	No or pregnancy only	2,724	95.3%	94.3%	96.2%
1999	Have diabetes	147	4.6%	3.6%	5.5%
1999	No or pregnancy only	3,036	95.4%	94.5%	96.4%
2000	Have diabetes	146	5.8%	4.6%	6.9%
2000	No or pregnancy only	2,736	94.2%	93.1%	95.4%
2001	Have diabetes	175	4.6%	3.7%	5.4%
2001	No or pregnancy only	3,453	95.4%	94.6%	96.3%
2002	Have diabetes	207	5.2%	4.3%	6.1%
2002	No or pregnancy only	3,855	94.8%	93.9%	95.7%

Denominator includes all survey respondents ages 18 years and older except those with missing, don't know and refused answers. If the query was limited to a particular sub-population-group, only those respondents are included in the denominator.
Data source: Behavioral Risk Factors Surveillance System (BRFSS), Office of Public Health Assessment, Utah Department of Health

I) Place (Geography)

Rates can vary by geography. Urbanized areas can often show different rates than the surrounding rural areas. IBIS-Q has three different geographic divisions available: County, Local Health District, and Small Area.

County. Utah is composed of 29 counties. You can narrow your query to a county. See the Crude Rate example on page 2.

Local Health District. There are 12 Local Health Districts in Utah, six single county districts and six multi-county districts. In IBIS-Q you can narrow your search by Local Health District. See the Count example on page 1.

Small Area. In order to facilitate reporting data at the community level Utah has been divided into 61 small areas. Areas are determined based on specific criteria, including population size, political boundaries of cities and towns, and economic similarity. The health measures that are reported by small area are those with events occurring with sufficient frequency to be meaningful. The IBIS query system allows you to query by small area for the Birth Certificate and Infant Mortality databases, the Mortality database, the Hospital Discharge and Emergency Department Visit databases, and the Utah Population Estimates database.

Exercise:

Find the number of treat and release Emergency Department Visits in 2001 for your small area. (Only a sampling of small areas is shown here.)

For more information on Utah's Small Areas see http://hlunix.hl.state.ut.us/ibisq/UtahSmallAreaInfo.pdf

Table 9: Count of Treat and Release Emergency Department Visits by Selected Small Area, Utah, 2001.

Small Areas	
All	1,629,038
Brigham City	16,964
Other Box Eldr Co.	15,236
Logan	37,589
Other Cache/Rich Co.	23,677
Ben Lomond	33,329
Morgan/E Weber Co.	12,544
Downtown Ogden	34,401
South Ogden	25,008
Roy/Hooper	22,379
Riverdale	17,781
Clearfield/Hill AFB	30,870
Layton	31,549
Syracuse/Kaysville	14,869
Farmington/Centerville	14,029
Woods Cross/No SL	13,870
Bountiful	30,318
Rose Park	27,787

Data source: Emergency Department Visit Database, Bureau of Emergency Medical Services, Utah Department of Health. Most rates are computed using number of persons in the population. IBIS population estimates are from Utah Governor's Office of Planning and Budget population estimates.

J) Person

Age and sex are important aspects of data analysis by person. Some health data is age related or sex related. Looking at rates and counts for age groups and by gender can provide further information.

Exercise:

Find the Intendedness of pregnancy for 1999-2000 for different age groups using the PRAMS query module.

Table 10: Intendedness of Pregnancy by Age Group, Utah, 1999-2000.

Age Group	Intend to get pregnant	Number in Sample	Percentage
Total	Intended	2,003	67.4%
Total	Not intended	1,071	32.6%
<17 Years	Intended	20	20.2%
<17 Years	Not intended	69	79.8%
18-19 Years	Intended	44	29.2%
18-19 Years	Not intended	119	70.8%
20-24 Years	Intended	582	65.5%
20-24 Years	Not intended	353	34.5%
25-29 Years	Intended	713	73.5%
25-29 Years	Not intended	290	26.5%
30-34 Years	Intended	413	73.5%
30-34 Years	Not intended	158	26.5%
35-39 Years	Intended	182	75.2%
35-39 Years	Not intended	59	24.8%
40+	Intended	49	79.9%
40+	Not intended	23	20.1%

Data source: Utah Pregnancy Risk Assessment Monitoring System (PRAMS), Utah Department of Health

K) ICD Codes

ICD Stands for "International Classification of Diseases." It is a coding system maintained by the World Health Organization and the U.S. National Center for Health Statistics used to classify causes of death on death certificates and diagnoses, injury causes, and medical procedures for hospital and emergency department visits. These codes are updated every decade or so to account for advances in medical technology. Beginning in 1999, the U.S. changed over from the 9th revision (ICD-9) to the 10th revision (ICD-10) to record cause of death on death certificates. Hospitals have not yet moved away from ICD-9.

For more information on ICD codes see http://hlunix.hl.state.ut.us/ibisq/ICD_help.html.

Exercise:

Find the Age-Adjusted death rate for 1999-2002 for “Fall on and from stairs and steps” using the ICD-10 code (under External Injuries).

Table 11: Age-adjusted Deaths Per 100,000 Population for “Fall on and from stairs,” Utah, 1999-2002.

Year of Death	Age-adjusted Death Rates (per 100,000 pop.)			
	Number of Deaths	Number of Population	Age-adjusted Death Rate (per 100,000 pop.)	95% Confidence Interval
1999	X	2,193,006	X	X
2000	9	2,246,553	0.54	0.24 - 0.85
2001	13	2,295,964	0.86	0.48 - 1.24
2002	20	2,321,707	1.26	0.80 - 1.72

Date source: Utah Death Certificate Database, Office of Vital Records and Statistics, Utah Department of Health. Most rates are computed using number of persons in the population. IBIS population estimates are from 2002 Baseline Projections, Governor's Office of Planning and Budget, UPED Model System.

L) NCHS Leading Causes of Death

NCHS (National Center for Health Statistics) is a part of CDC. They provide lists of leading causes of death. On IBIS you can query using causes from two different lists from NCHS.

NCHS 113. Refer to http://health.utah.gov/ibisq/nchs_113.html for a complete listing.

NCHS 50. Refer to http://health.utah.gov/ibisq/nchs_50.html for a complete listing.

Exercise:

Find the Death Rate for Parkinson's Disease for 2000-2002 with four age groups, use NCHS 113. (Use NCHS 50 in Counts and Age and Sex Specific sections.)

Table 12: Deaths from Parkinson's Disease Per 100,000 Population by Age Group, Utah, 2000-2002.

Age Group	Death Rates (per 100,000 pop.)			
	Number of Deaths	**Number of Population**	**Death Rate (per 100,000 pop.)**	**95% Confidence Interval**
All	408	6,864,224	5.94	5.37 - 6.52
15-44	X	3,261,619	X	X
45-64	6	1,196,320	0.50	0.10 - 0.90
65+	401	581,733	68.93	62.19 - 75.68

Date source: Utah Death Certificate Database, Office of Vital Records and Statistics, Utah Department of Health. Most rates are computed using number of persons in the population. IBIS population estimates are from 2002 Baseline Projections, Governor's Office of Planning and Budget, UPED Model System..